

Notice of Allowability

Application No.

10/695,642

Examiner

Thanhha Pham

Applicant(s)

SASHIDA ET AL.

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/10/2006 and interview dated 10/26/2006.
2. ☒ The allowed claim(s) is/are 1,4,5,7-12 and 14-21.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

THANHHA S. PHAM
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

1. Claim 1 allowable. The restriction requirement between species, as set forth in the Office action mailed on 3/23/2005, has been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Claims 12, 14, 16-21 are no longer withdrawn from consideration because the claim(s) requires all the limitations of an allowable claim.

In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Darrin Auito on 10/26/2006.

The application has been amended as follows:

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- Cancel claim 13

- In claim 14,

line 3, change "on a conductive plug and a peripheral area" to -- on the insulating layer--

line 4, after "the first conductive film" insert -- wherein the insulating film including a conductive plug therein, the conductive plug being under the self-orientation layer and the first conductive film, and the capacitor lower electrode being formed on the conductive plug --

line 5, change "an oxidation-preventing insulating film" to -- an oxidation-preventing insulating layer --

lines 5-6, change "an adhesive insulating film" to -- an adhesive insulating layer --

line 7, change "film" ('s) (2 occurrences) to -- layer --

line 10, change "film" ('s) (2 occurrences) to -- layer --

- In claim 15,

line 6, after "at least" insert -- a portion of the ferroelectric film --

- In claim 16,

line 5, change "via" to -- and --

- In claim 17,

lines 2-3, change "the second conductive film has two steps of forming a lower conductive film and a forming an upper conductive film" to -- forming the

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second conductive film comprising forming a lower conductive film and forming an upper conductive film --

- In claim 20,

line 3, change "to 600 to 650" to -- from 600°C to 650°C --

Allowable Subject Matter

3. Claims 1, 4-5, 7-12, 14-21 are allowed.

4. The following is an examiner's statement of reasons for allowance:

► Recorded Prior Art fails to disclose or suggest the combination of the process steps of manufacturing a semiconductor device as recited in the base claim 1 including: exciting a plasma of an ammonia gas having a molecule structure in which hydrogen and nitrogen are bonded and irradiating the plasma onto the insulating film to form nitrogen-hydrogen (N-H) bonds on a surface thereof; forming a self-orientation layer made of a substance having a self-orientation characteristic on the insulating film; wherein, after the plasma is irradiated onto the insulating film, the self-orientation layer is formed on the insulating film, wherein the insulating film is kept in a vacuum state without being exposed to the atmosphere during the period from the irradiation of plasma until the formation of the self-orientation layer.

► Recorded Prior Art fails to disclose or suggest the combination of the process steps of manufacturing a semiconductor device as recited in claim 5 including: exciting a plasma of an ammonia gas having a molecule structure in which hydrogen and nitrogen are bonded and irradiating the plasma onto the insulating film to form nitrogen-

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hydrogen (N-H) bonds on a surface thereof; forming a self-orientation layer made of a substance having a self-orientation characteristic on the insulating film; wherein a surface of the insulating film is dehydrated by coating alcohol thereon after the plasma is irradiated onto the insulating film and before the self-orientation layer is formed.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



THANHHA S. PHAM
PRIMARY EXAMINER